

What is the economic viability of CSP power plants in Iran?

The feasibility analysis showed that a huge part of the center and south regions of Iran including the arid and semi-arid locations, receive DNI in the range of 2100-2400 kWh/m² and even higher showing the economic viability of CSP power plants constructions.

Is solar energy a viable option in Iran?

The potential for PV is extremely high in Iran, mainly due to having about 300 clear sky sunny days per year on two-thirds of its land area and an average 2200 kWh solar radiation per square meter (Najafi et al. 2015).

What is the share of non-hydro renewable power plants in Iran?

Share of non-hydro renewable power plants during Iran's 4th, 5th and 6th FYDP are 0.23%, 0.27% and 0.36% respectively.

How much wind power does Iran have in the MENA region?

Although Iran was the leader in the MENA region with regard to power generation from wind energy with 92 MW installed capacity in 2010 (Farfan and Breyer 2017), it has experienced flat growth in recent years. However, 27 MW of installed wind power capacity was added to the system in 2014 (Farfan and Breyer 2017).

Is LCOE a competitive cost for 100% RE energy systems in Iran?

From Table 11, it can be seen that the total LCOE for both analyzed scenarios are low. However, the integrated scenario shows a much more competitive cost for 100% RE energy systems for Iran in the year 2030. An 11% decrease in total LCOE can be observed in the integrated scenario due to a reduction of all estimated levelized costs (Fig. 5).

Why is energy use in Iran so inefficient?

Energy use in Iran is inefficient mainly due to huge energy subsidies by the government. The country's energy intensity is 36 and 27% higher than the global average and the Middle Eastern average, respectively (IEA 2016; The World Bank 2014).

Concentrating Photovoltaic (CPV) can be identified to replace relatively expensive PV cells with cheaper reflectors to lower the cost [3]. But the main concern that lies with CPV ...

concentrated photovoltaic-thermoelectric system (CPV-TE). The main objective of this work is ... (Iran) climatic conditions. Shittu et al. [20] performed a detailed comparative study on the ...

This paper evaluates the performance of a concentrating photo-voltaic thermal (CPVT) hybrid system for space heating, providing hot water, and grid-connected (GC) electricity generation ...

The overall aim of this work is to assess the performance of high-efficiency solar trigeneration systems in order to fulfill an industrial complex heating and cooling demands. The ...

Generally, there are two different technologies namely photovoltaic panel (PV) and concentrated solar power (CSP) for electricity generation [13]. The CSP technology uses concentrated solar radiation as a high-temperature thermal energy source to drive steam turbines and converts it to the electricity [14,15].

This paper aims to provide a concentrated photovoltaic thermal (CPVT) system regarding the high potential of receiving solar energy in Iran. Generated thermal energy of the system supplies the average thermal load of a commercial building and also its generated electricity is sold to the grid according to Iran's feed-in tariff (FiT). In order ...

The PV systems that use concentrated light are called concentrating photovoltaics (CPV). The CPV collect light from a larger area and concentrate it to a smaller area solar cell. This is illustrated in Figure 5.1. Figure 5.1. This is ...

The concentration ratios achieved range from 1.5 - 2.5. Low concentration cells are usually made from monocrystalline silicon. No cooling is required. The largest low-concentration photovoltaic plant in the world is Sevilla PV with modules ...

Purpose of Review As the renewable energy share grows towards CO₂ emission reduction by 2050 and decarbonized society, it is crucial to evaluate and analyze the technical and economic feasibility of solar energy. ...

Considering a discount rate, DR, of 5% [81] and an inflation rate, IR, of 1.23% [82], the system payback period, ... A review of the concentrated photovoltaic/thermal (CPVT) hybrid solar systems based on the spectral beam splitting technology. Appl Energy, 187 ...

A comparison of CSP and PV technologies for Egypt found the LCoE of a CSP plant to be 1.68 times higher than a PV plant and the payback period to be 7.7 years for CSP versus 6.6 years for PV, suggesting PV is more economically viable in China's climate while CSP is more feasible in Egypt's climate: Egypt: 8: Fan et al. [108] 2023: China

The use of a concentrated photovoltaic (CPV) system significantly reduces the required solar cell area that often accounts for the major cost of a PV solar system. ... ? g (22) The thermal conversion efficiency can be estimated as in Equation (23) [30]: $\eta_{th} = Q_{cool} / IR$ (23) The combined heat and PV power (CHP) efficiency is calculated by ...

The non-concentrating PV/T solar collectors have been studied and investigated in various studies in the literature. Sun et al. created a mathematical model regarding the dynamic simulation of how a water system ...

In this study, energy and economic analyses of three small-scale solar power plants were conducted in various parts of Iran. The power plants were polycrystalline photovoltaic (PV), concentrating photovoltaic ...

Greenhouse gas emission increased in recent years and it is the main reason for global warming. To overcome the challenges, sustainable and renewable energy sources are required. In this paper, an economic analysis fulfilled for 1.2 megawatt photovoltaic power plant with different tracking systems in several cities of Iran by RETScreen software. Moreover, ...

Concentrated photovoltaic thermal (CPVT) is the most employed system for providing both thermal and electrical energy from the incoming solar energy ... Techno-economic assessment and environmental impact of concentrating solar power plants in Iran. *Renew. Sustain. Energy Rev.*, 120 (2020), Article 109642. View PDF View article View in Scopus ...

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